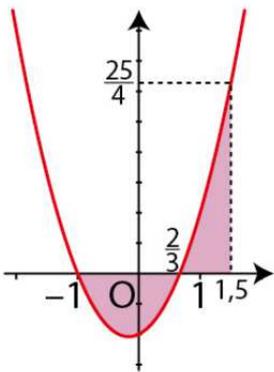


Applications du calcul intégral

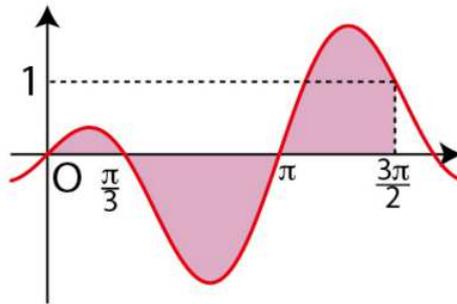
Exercice 13

Dans chaque cas, calculer l'aire, en unités d'aire, du domaine coloré.

a) $x \mapsto 3x^2 + x - 2$



b) $x \mapsto (2 \cos x - 1) \sin x$



CORRECTION

$$\mathbf{a)} \quad A = \int_{-1}^{\frac{2}{3}} -f(x) dx + \int_{\frac{2}{3}}^{1,5} f(x) dx$$

$$= \left[-x^3 - \frac{x^2}{2} + 2x \right]_{-1}^{\frac{2}{3}} + \left[x^3 - \frac{x^2}{2} - 2x \right]_{\frac{2}{3}}^{1,5}$$

$$A = \frac{125}{54} + \frac{125}{54}$$

$$A = \frac{125}{27}$$

$$\mathbf{a)} \quad A = \int_0^{\frac{\pi}{3}} f(x) dx + \int_{\frac{\pi}{3}}^{\pi} [-f(x)] dx + \int_{\pi}^{\frac{3\pi}{2}} f(x) dx$$

$$A = \left[\sin^2 x + \cos x \right]_0^{\frac{\pi}{3}} + \left[-\sin^2 x - \cos x \right]_{\frac{\pi}{3}}^{\pi} + \left[\sin^2 x + \cos x \right]_{\pi}^{\frac{3\pi}{2}}$$

$$A = \frac{5}{4} - 1 + 1 + \frac{5}{4} + 1 + 1$$

$$A = \frac{9}{2}$$